

**Amendments to the Drawings:**

Please replace the original drawing sheets submitted with this Application with the replacement drawing sheets attached as Appendix C.

## REMARKS

### Remarks regarding Amendments to the Specification

The Examiner in the '908 office action objected to the disclosure because of the several informalities which resulted in the bulk of the amendments shown in the marked up version of the replacement specification.

Review of the application and preparation of the replacement specification showed a need to amend the abstract to be consistent with the other amendments being made.

A hard disk mounting hub has a disk-mounting face formed at one end as a truncated conical surface of revolution symmetric about the hub central axis. A cylindrical inner hub member is coaxial with the hub body outside diameter and the surrounding mounting face. The inner hub member is adapted to receive a planar disk with a central mounting hole with disk inside diameter fitted around it opening. The mounting face is disposed at a hub conning face angle ( $\pi/2 +/\!-\! \Omega$ ) relative to the hub central axis. Hub conning face angle  $\Omega$  is selected so that a disk mounting clamping force  $F$  applied to an inner disk portion surrounding the central mounting opening bends a portion of the disk interior to the hub inside diameter to conform contiguous facing relationship with the conical disk-mounting face. This interior bending portion reduces or eliminates the tendency of the outer disk portion to form an excessive conning angle  $\theta \Phi$ .

### Objections to the Drawings in this application and in the '908 office action

The Examiner in this application has objected to the Drawings, requiring that the clamp member structures recited in Claims 8, 9, 10, 17 and 18 must be shown or the feature(s)

cancelled from the Claims. All the Figures have been amended as shown in the attached replacement sheets. Claims 8, 10, 17, and 18 have been amended as follows:

8. (Currently amended) The disk mounting hub of claim 3,  
~~wherein said disk attaches to said disk mounting hub by applying in which said clamping force F is applied through a clamp adapter to say said opposite disk face of said disk by a clamping member attached to said hub mounting member.~~

9. (Currently amended) The disk mounting hub of claim 8, ~~in which said hub mounting clamp member includes an axial acting spring member between a disk contact end in contact with said opposite disk surface and a rigid base end mounted to said hub mounting member at its extreme proximal end wherein said clamp adapter member is arranged to exert said clamping force F on said disk surface toward said disk mounting hub.~~

17. (Currently amended) The hard disk drive of claim 10, further including:  
~~said disk attached to said disk mounting hub by applying in which said clamping force F through a clamp adapter is applied to said opposite disk face of said disk by a clamping member attached to said hub mounting member.~~

18. (Currently Amended) The hard disk drive of claim 117, ~~in which wherein said hub mounting clamp adapter member includes an axial acting spring member between a disk contact end in contact with said opposite disk surface and a rigid base end mounted to said hub mounting member at its extreme proximal end wherein said clamp member is arranged to exert said clamping force F on said disk surface opposite face toward said disk mounting hub.~~

The Applicant submits that these amendments address the Examiner's objection, and respectfully requests that this objection to the Figures and above stated Claims be removed.

## Claim Rejections based upon 35 USC 112 2<sup>nd</sup> Paragraph

Claims 1 to 5, 7 to 14, and 16 to 18 stand rejected as being indefinite.

The Examiner has pointed out in Claims 1 and 10, "truncated conical surface" is indefinite and there is no clear reference stated for the "oblique hub conning angle". These Claims have been amended as follows:

1. (Currently amended) A ~~hard disk drive~~ mounting hub for mounting a disk having opposite parallel faces between a disk outside diameter and a coaxial disk inside diameter defining a central opening therethrough, wherein said disk mounting hub comprises:

a cylindrical hub body defining a hub outside diameter disposed along a central axis;

a cylindrical disk mounting member disposed coaxial with said central axis at one end of said body, defining the mounting member inside diameter extending proximally from said one end of said body, and sized to be received through said disk opening, and;

a coaxial hub face extending about said mounting member, said coaxial hub face defining a ~~truncated~~ conical surface of revolution symmetrical about said central axis, that is disposed at an oblique hub ~~conning~~ face angle  $\Omega$  relative to said central axis.

10. (Currently amended) A hard disk drive ~~having a disk clamp for fixing at least one disk mounted on a drive spindle by application of distributed axial compressive force F directed against one side of said at least one disk on said spindle, said axial force F distributed circumferentially and radially around said disk spindle, including: said a disk mounting hub of Claim 1. comprising:~~

~~a rigid cylindrical hub body defining a hub outside diameter disposed along a central axis;~~

~~a cylindrical disk mounting member disposed coaxial with said central axis at one end of said body, defining a coaxial member inside diameter extending proximally from said one end of said body, said member inside diameter sized to be received through said disk opening;~~

~~a coaxial hub face extending about said mounting member, said hub face defining a truncated conical surface of revolution symmetrical about said axis, that is disposed at an oblique hub conning angle  $\Omega$  relative to said axis.~~

The Applicant submits that the specific issues raised by the Examiner for rejecting these Claims have been resolved.

The Examiner has pointed out in Claims 4 and 13, the following are indefinite: “essentially conical contiguity” (unclear) and “within an acute disk conning angle limit” (no definition or range). These Claims have been amended as follows:

4. (Currently amended) The hard disk drive mounting hub of claim 3, wherein: said interior central portion of said disk bends toward essentially conical contiguity with said truncated conical hub face surface of said coaxial hub face at said oblique hub conning face angle  $\Omega$  and away from parallel to the remaining exterior portion of said disk, while said remaining exterior portion of said disk remains disposed within an acute disk conning angle limit  $\Phi_{\min}$  relative to a perpendicular to said central axis.

13. (Currently amended) The hard disk drive of claim 12, wherein: said interior central portion of said disk bends toward essentially conical contiguity with said truncated conical surface of said coaxial hub face surface at said oblique hub conning face angle  $\Omega$  and away from parallel planarity with the remaining exterior portion of said disk, while said remaining exterior portion of said disk

remains disposed within an acute disk conning angle limit  $\Phi_{\min}$  relative to a perpendicular to said central axis.

The Applicant submits that the specific issues raised by the Examiner for rejecting these Claims have been resolved.

Claims 1 to 5, 7 to 14, and 16 to 18 stand rejected as being indefinite in a general statement by the Examiner. These Claims have been amended as follows:

1. (Currently amended) A ~~hard disk~~ drive mounting hub for mounting a disk having opposite parallel faces between a disk outside diameter and a coaxial disk inside diameter defining a central opening therethrough, wherein said disk mounting hub comprises:

a cylindrical hub body defining a hub outside diameter disposed along a central axis;

a cylindrical disk mounting member disposed coaxial with said central axis at one end of said body, defining the mounting member inside diameter extending proximally from said one end of said body, and sized to be received through said disk opening, and;

a coaxial hub face extending about said mounting member, said coaxial hub face defining a ~~truncated~~ conical surface of revolution symmetrical about said central axis, that is disposed at an oblique hub conning face angle  $\Omega$  relative to said central axis.

2. (Currently amended) The ~~hard~~ disk mounting hub of claim 1, wherein: said disk mounting hub receives said disk mounted perpendicular to said hub central axis and fitted with said disk inside diameter around said mounting member inside diameter with one disk face proximal and adjacent to said coaxial hub face.

3. (Currently amended) The hard disk mounting hub of claim 2, wherein: a suitable clamping force  $F$  is applied toward said coaxial hub face from said opposite disk face over an interior central portion of said opposite disk face.

4. (Currently amended) The hard disk drive mounting hub of claim 3, wherein: said interior central portion of said disk bends toward essentially conical contiguity with said truncated conical hub face surface of said coaxial hub face at said oblique hub conning face angle  $\Omega$  and away from parallel to the remaining exterior portion of said disk, while said remaining exterior portion of said disk remains disposed within an acute disk conning angle limit  $\Phi_{\min}$  relative to a perpendicular to said central axis.

5. (Currently amended) The hard disk drive mounting hub of claim 1, wherein said oblique hub face angle  $\Omega$  is selected to form a hub face having a concave conical surface contour.

7. (Currently amended) The disk mounting hub of claim 1, in which said disk mounting hub comprises at least one hub material materials selected from the group consisting of aluminum and steel.

8. (Currently amended) The disk mounting hub of claim 3, wherein said disk attaches to said disk mounting hub by applying in which said clamping force  $F$  is applied through a clamp adapter to say said opposite disk face of said disk by a clamping member attached to said hub mounting member.

9. (Currently amended) The disk mounting hub of claim 8, in which said hub mounting clamp member includes an axial acting spring member between a disk contact end in contact with said opposite disk surface and a rigid base end mounted to said hub mounting member at its extreme proximal end wherein said

clamp adapter member is arranged to exert said clamping force F on said disk surface toward said disk mounting hub.

10. (Currently amended) A hard disk drive ~~having a disk clamp for fixing at least one disk mounted on a drive spindle by application of distributed axial compressive force F directed against one side of said at least one disk on said spindle, said axial force F distributed circumferentially and radially around said disk spindle, including: said a disk mounting hub of Claim 1, comprising:~~

~~a rigid cylindrical hub body defining a hub outside diameter disposed along a central axis;~~

~~a cylindrical disk mounting member disposed coaxial with said central axis at one end of said body, defining a coaxial member inside diameter extending proximally from said one end of said body, said member inside diameter sized to be received through said disk opening;~~

~~a coaxial hub face extending about said mounting member, said hub face defining a truncated conical surface of revolution symmetrical about said axis, that is disposed at an oblique hub conning angle  $\Omega$  relative to said axis.~~

11. (Currently amended) The hard disk drive of claim 10, wherein:

~~said disk mounting hub receives said at least one mounted disk perpendicular to said hub central axis and fitted with disk inside diameter said disk opening around said cylindrical disk mounting member inside diameter with one disk face of said faces proximal and adjacent to said coaxial hub face.~~

12. (Currently amended) The hard disk drive of claim 11, wherein: a distributed clamping force F is applied and distributed toward said coaxial hub face from said an opposite of said disk face over an interior central portion of said opposite disk face.

13. (Currently amended) The hard disk drive of claim 12, wherein: said interior central portion of said disk bends toward ~~essentially conical contiguity with said truncated conical surface of said coaxial hub face surface at said oblique hub conning face angle  $\Omega$  and away from parallel planarity with the remaining exterior portion of said disk, while said remaining exterior portion of said disk remains disposed within an acute disk conning angle limit  $\Phi_{\min}$  relative to a perpendicular to said central axis.~~

14. (Currently amended) The hard disk drive of claim 10, wherein said oblique hub face angle  $\Omega$  is selected to form a said coaxial hub face having a concave conical surface contour.

16. (Currently amended) The hard disk drive of claim 10, in which said disk mounting hub comprises materials at least one hub material selected from the group consisting of aluminum and steel.

17. (Currently amended) The hard disk drive of claim 10, further including:  
said disk attached to said disk mounting hub by applying in which said clamping force F through a clamp adapter is applied to said opposite disk face of said disk by a clamping member attached to said hub mounting member.

18. (Currently Amended) The hard disk drive of claim 117, in which wherein said hub mounting clamp adapter member includes an axial acting spring member between a disk contact end in contact with said opposite disk surface and a rigid base end mounted to said hub mounting member at its extreme proximal end wherein said clamp member is arranged to exert said clamping force F on said disk surface opposite face toward said disk mounting hub.

The Applicant submits that these Claims as amended address the issue of indefiniteness in general, and requests that the Examiner remove this rejection to these Claims.

## Claim Rejections based upon 35 USC 102(e)

Claims 1 to 5, 8 to 14, 17, and 18 stand rejected as anticipated by Koyanagi et al (US Patent 6,785,090). As amended, all the pending Claims are dependent upon **Claim 1**. The Applicant disagrees with the rejection of this Claim.

1. (Currently amended) A hard disk drive mounting hub for mounting a disk having opposite parallel faces between a disk outside diameter and a coaxial disk inside diameter defining a central opening therethrough, wherein said disk mounting hub comprises:

a cylindrical hub body defining a hub outside diameter disposed along a central axis;

a cylindrical disk mounting member disposed coaxial with said central axis at one end of said body, defining the mounting member inside diameter extending proximally from said one end of said body, and sized to be received through said disk opening, and;

a coaxial hub face extending about said mounting member, said coaxial hub face defining a ~~truncated~~ conical surface of revolution symmetrical about said central axis, that is disposed at an oblique hub ~~conning~~ face angle  $\Omega$  relative to said central axis.

The Applicant submits that Koyanagi discloses a hub face with regards reference number 41b in Figure 4, and shown without reference number in Figures 2, 5, 7, 9, 10 and with regards reference number 23b in Figures 8 and 11, consistently lacking the hub face “defining a conical surface of revolution symmetrical about said central axis, that is disposed at an oblique face angle  $\Omega$  relative to said central axis”. Koyanagi discloses and teaches a hub face which cannot define a conical surface of revolution. Consequently, the Applicant submits that Koyanagi’s hub face does not have this element of the invention, and cannot be seen to anticipate this invention. This Claim is allowable, and the Examiner is requested to remove the rejection of this Claim.

The remaining, pending Claims are dependent upon Claim 1, and inherit its elements. The Applicant submits that Koyanagi discloses a hub face consistently lacking the hub face “defining a conical surface of revolution symmetrical about said central axis, that is disposed at an oblique

face angle  $\Omega$  relative to said central axis". Koyanagi discloses and teaches a hub face which cannot define a conical surface of revolution. Consequently, the Applicant submits that Koyanagi's hub face does not have this element of the invention, and cannot be seen to anticipate this invention. This Claim is allowable, and the Examiner is requested to remove the rejection of this Claim.

### **Other Matters**

A number of other amendments to the specifications have been made to correct typographical errors in the specification. Any amendments not specifically discussed above in response to the issues raised by the Examiner in the Office Action mailed November 19, 2005 were made to correct these typographical errors.

### **CONCLUSION**

All of the amendments to the specification, Claims and Figures of this application have been made for the purpose of clarifying the invention and do not represent the introduction of new matter.

The Applicant submits that the claims all define novel subject matter that is nonobvious. Therefore, allowance of these claims is submitted to be proper and is respectfully requested.

Applicant invites the Examiner to contact Applicant's representative as listed below for a telephonic interview if so doing would expedite the prosecution of the application.

Very respectfully submitted,

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